

### **Baiting Onion Maggot Flies with Bt.**

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#### **Introduction**

Onion maggots (*Delia antiqua*) can cause severe production losses in onion fields, with losses reaching levels near 100% in the absence of control measures.

In New York the onion maggot has three generations (Eckenrode, 1975). The first generation is the most destructive, because the onion plants are very susceptible to onion maggot damage caused by larval feeding at the time of first generation onion maggot emergence in late May-early June. At present, growers apply organophosphorous insecticides (Lorsban, Dyfonate) in a furrow drench treatment at planting time, and the 1996 and 1997 growing seasons have seen limited use under an emergency (section 18) registration of an insect growth regulator (Trigard) incorporated in the seed pellet. These insecticide applications are only effective in controlling first generation onion maggots and typically reduce damage levels to 2-10 %. Good control of first generation onion maggots reduces populations to the point that second and third generation onion maggots are a relatively minor problem. Several onion maggot populations have been shown to have reached detectable levels of resistance to Lorsban, leaving the burden of onion maggot control on only one registered partially effective material, Lorsban.

Growers use pyrethroid insecticide sprays in an attempt to kill adult flies of the second and third generation. In order for these sprays to be effective, onion maggot flies have to be physically covered with the spray. At any give time, less than 20 % of the spring onion maggot fly population is actually in the onion field, leaving about 80 % of the fly population untreated by any application of insecticides (Finch et al., 1986 ).

Laboratory studies conducted by Dr. Eckenrode indicated mortalities close to 100% when adult flies were fed a 10% sugar solution laced with Bt insecticide. With present onion maggot control strategies focusing on the larval, in-ground stage and the absence of effective material for adult fly control, we have proposed to investigate the possibility of using bait solutions containing Bt for the control of adult onion maggot flies under limited field conditions.

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